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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/026,477	12/27/2001	Hong Suk Yoo	8733.561.00	7762

30827 7590 12/15/2006

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EXAMINER

RUDE, TIMOTHY L

ART UNIT	PAPER NUMBER
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2871

DATE MAILED: 12/15/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/026,477

Applicant(s)

YOO ET AL.

Examiner

Timothy L. Rude

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 September 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-5 and 15-25 is/are pending in the application.
- 4a) Of the above claim(s) 1 and 3-5 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 15-25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claims

Claim 15 is amended.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 15-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moon in view of Yamazaki et al (Yamazaki) USPAT 5,815,226.

As to claim 15, Moon discloses in the 5th embodiment (col. 6, lines 8-63 and Figures 8A-8D) a liquid crystal display (LCD) device comprising:
a first substrate , 100; a second substrate;
a liquid crystal layer formed between the first and second substrates;
a storage capacitor, (combination of 4, 6, 1, 2, and unlabeled 9; col. 6, lines 10-30),
formed in a first region of the first substrate;
a thin film transistor formed in a second region of the first substrate.

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a gate electrode, 3, for the thin film transistor and a storage capacitor electrode, 4, spaced apart from the gate electrode [note it comprises the line running off Figure 5 on both sides], both formed on the first substrate;

a first insulating layer, 5, formed on the overall surface [col. 4, lines 1-13] of the first substrate [Applicant's formed on an entire surface of the first substrate];

a second insulating layer, 6, formed on the first insulating layer and the storage capacitor electrode;

a conductive layer (unlabeled layer between layers 2 and 10 above 4) formed on the second insulating layer overlapping the storage capacitor electrode in the first region; and

a pixel electrode (not shown, inherent to comprise functional device) electrically connected to the conductive layer (unlabeled layer between layers 2 and 10 above 4 in Figure 8D) and a drain electrode, 9, on the thin film transistor, wherein the length of the conductive layer is shorter than the length of the storage capacitor electrode, 4, per Figure 5.

Moon does not explicitly disclose removing a first insulating layer, 5, formed on an entire surface of the first substrate exclusively from an upper portion of the storage capacitor electrode. However, the teachings of Moon are considered to render the claimed invention obvious to those having ordinary skill in the art of liquid crystals, since there is no disclosed functional significance to the minor structural difference as claimed in either Moon or Applicant's enabling disclosure.

In considering the disclosure of a reference it is proper to take into account not only specific teachings of the reference but also the inferences which one skilled in the art would reasonably be expected to draw therefrom (MPEP 2144.01).

Furthermore, election of species should not be required if the species claimed are considered clearly unpatentable (obvious) over each other (MPEP 808.01(a)). Applicant's specification teaches removal of the first insulating layer from above the capacitor electrode, but it does not explicitly teach retention of the first insulating layer everywhere else. Applicant has merely indicated removal of the first insulating layer from above the capacitor electrode is required to comprise the claimed invention (as does Moon), so alternate species wherein the first insulating layer is retained or eliminated from other regions are considered clearly unpatentable (obvious) over each other since they are not explicitly precluded by Applicant's specification and since there is no teaching as to the significance of one over the other in either Moon or Applicant's enabling disclosure. Both Applicant and the applied prior art, Moon, teach the same advantage of a thinned insulator above the capacitor electrode and any subtle species variation(s) are considered obvious species variations that are unpatentable over each other (MPEP 808.01(a)). Furthermore, it is well known in the art that removal of an insulation layer takes time, effort, and cost, so one would be inclined to remove only that minimal portion. Alternately, some elect to expend the additional time, effort, and cost, to remove unnecessary insulation layer(s) from the pixel region in order to slightly improve optical performance. Such cost vs performance trade-offs are well known in the art at the time the claimed invention was made, which reinforces examiner's position

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that they are obvious species variations. In this case, Applicant's species is the lower cost species while the applied prior art teaches the higher optical performance species.

Moon is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to remove the first insulating layer from the capacitor electrode to facilitate formation of a capacitor with increased capacity and thereby allow the improvement of aperture ratio [col. 4, lines 14-30], regardless of whether one chooses to remove the first insulating layer from anywhere else.

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the LCD of Moon with the removal of the first insulating layer from the capacitor electrode (exclusively or in conjunction with removal from other areas, e.g., pixel area) to facilitate formation of a capacitor with increased capacity and thereby allow the improvement of aperture ratio.

FIG.8D

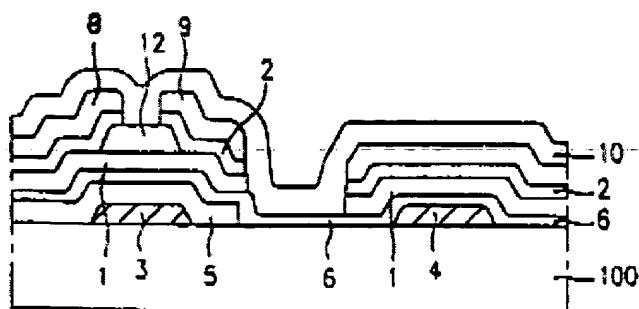
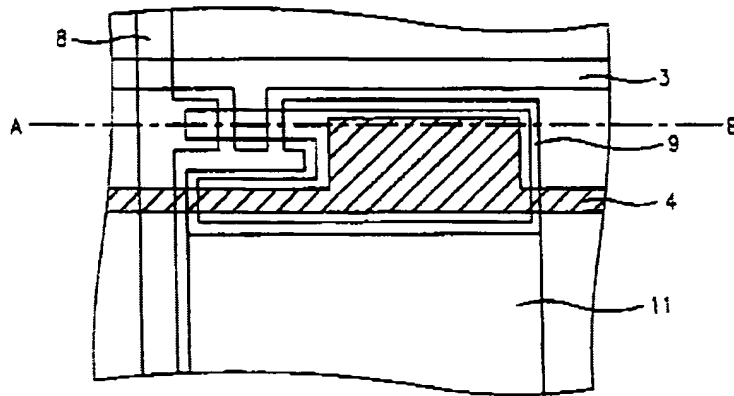


FIG.5



As to newly added limitations:

Yamazaki teaches the advantages [col. 10, lines 1-19] of making the conductive layer width shorter [portion of 607 close to electrode 603] than the width of the storage capacitor electrode in order to maximize aperture ratio while still achieving needed capacitance with a thinner insulating layer [removed portions of 317 and 315].

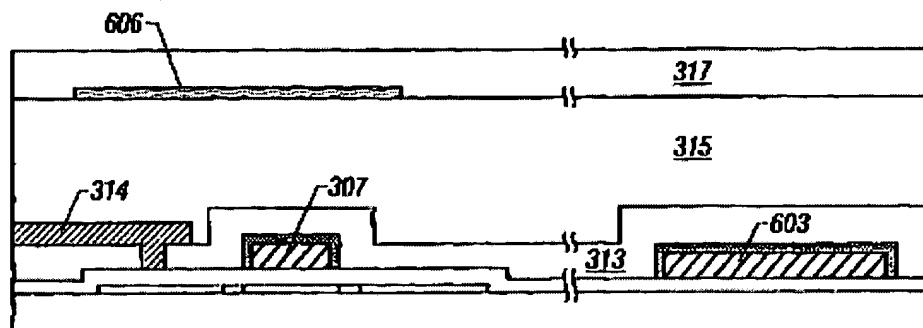


Figure 7A

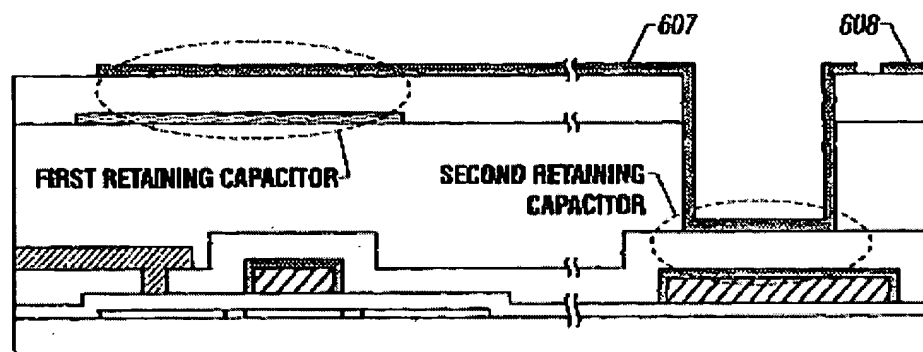


Figure 7B

Yamazaki is evidence that workers of ordinary skill in the art would find the reason, suggestion, or motivation to make the conductive layer width shorter [portion of 607 close to electrode 603] than the width of the storage capacitor electrode in order to maximize aperture ratio while still achieving needed capacitance with a thinner insulating layer [removed portions of 317 and 315].

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the invention with a conductive layer width shorter [portion of 607 close to electrode 603] than the width of the storage capacitor

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electrode in order to maximize aperture ratio while still achieving needed capacitance with a thinner insulating layer [removed portions of 317 and 315].

As to claim 16, Moon in view of Yamazaki disclose the device above.

Moon does not explicitly disclose a device wherein the gate insulating layer of the first region, 6 (Applicant's second insulating layer), has a thickness in a range of about 100Å~4000Å.

Moon teaches the purpose of removing the first insulating layer (Applicant's thinner insulating layer in the first region) is to increase the value of capacitance to allow increased viewing angle (Title and col. 6, lines 30-40) which constitutes a results effective variable.

Moon is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to reduce the gate insulating layer thickness of the first region to a thickness in a range of about 100Å~4000Å to increase the value of capacitance to allow increased viewing angle.

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the LCD of Moon with the reduced gate insulating layer thickness of the first region to a range of about 100Å~4000Å to increase the value of capacitance to allow increased viewing angle.

As to claim 17, Moon discloses in Figure 8D the liquid crystal display device as claimed in claim 15, further comprising a semiconductor layer, 1, formed above the second insulating layer in the second region and used as a channel of the thin film transistor.

As to claim 18, Moon discloses in Figure 8D the liquid crystal display device as claimed in claim 17, further comprising a source electrode, 8, and a drain electrode, 9, opposing each other and formed above the semiconductor layer.

As to claim 19, Moon discloses in Figure 8D the liquid crystal display device as claimed in claim 18, wherein the conductive layer (unlabeled 9 between 2 and 10) is of the same material as the source and drain electrodes and formed on the second insulating layer in the first region.

As to claim 20, Moon discloses in Figure 8D the liquid crystal display device as claimed in claim 18, further comprising an ohmic contact layer, 2, formed at an interface between the source and drain electrodes and the semiconductor layer.

As to claim 21, Moon discloses in Figure 8D the liquid crystal display device as claimed in claim 18, further comprising a passivation layer, 10, having a contact hole and formed on an entire surface including the conductive layer and the source and drain electrodes to expose upper portions of the drain electrode and the conductive layer.

As to claim 22, Moon discloses in Figure 8D the liquid crystal display device as claimed in claim 21, wherein the pixel electrode electrically connects to the drain electrode and the conductive layer through the contact hole (inherent to a functional device and obvious to those having ordinary skill in the art given the other embodiments of Moon).

2. Claims 23-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moon in view of Yamazaki, as applied to claims above, in view of Hwang USPAT 6,545,730 B1.

As to claims 23-25, Moon in view of Yamazaki discloses the LCD device as claimed in claim 15.

Moon does not explicitly disclose a device wherein the second substrate further includes: a plurality of Red (R), green (G), and blue (B) color filter patterns formed on the second substrate opposite to the first substrate for displaying colors; a black matrix for dividing the respective color filter patterns and for shielding light; and a common electrode for applying a voltage to the liquid crystal layer, however this is well known in the art.

For example, Hwang teaches in the background of the invention, and in the first preferred embodiment, a second substrate, 200, comprising a plurality of Red (R),

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including the black matrix and the color filter patterns, to achieve good color display performance with good contrast and good aperture ratio.

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the LCD of Moon with the second substrate comprising a plurality of Red (R), green (G), and blue (B) color filter patterns for displaying colors; a black matrix for dividing the respective color filter patterns and for shielding light; and a common electrode for applying a voltage to the liquid crystal layer formed on the entire surface including the black matrix and the color filter patterns of Hwang to achieve good color display performance with good contrast and good aperture ratio.

References cited but not applied are relevant to the instant Application.

Response to Arguments

3. Applicant's arguments with respect to all claims have been considered but are moot in view of the new ground(s) of rejection.

Conclusion


Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Timothy L. Rude whose telephone number is (571) 272-2301. The examiner can normally be reached on Mon-Thurs.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David C. Nelms can be reached on (571) 272-1787. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



tlr

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